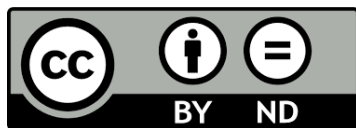




INFOGRAPHIC

THU NHẬN CAO CHIẾT TỪ LÁ ỚT SỪNG VÀNG VÀ ỨNG DỤNG TRONG MÀNG BẢO QUẢN THỊT GÀ

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Năm xuất bản:	2026



Thu nhận cao chiết từ lá ớt sừng vàng và ứng dụng trong màng bảo quản thịt gà
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THE 9th NGUYEN TAT THANH UNIVERSITY STUDENT RESEARCH WORKSHOP (NTTU-SRW)



BIOENGINEERING

EXTRACTION OF CAPSICUM FRUTESCENS L. LEAF EXTRACT AND ITS APPLICATION IN CHICKEN MEAT PRESERVATION FILM

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ABSTRACT

This study evaluated yellow horn chili leaf (*Capsicum frutescens* L.) extract incorporated into chitosan – gelatin composite films for fresh chicken breast preservation. Bioactive extracts rich in polyphenols and flavonoids were integrated into films (0%, 2.5%, 3%, 3.5% and 4%). FTIR confirmed successful intermolecular cross-linking, with the 4% extract film maintaining stable mechanical strength (15,0 MPa). During 7 days of storage, the active dip-coating effectively stabilized meat pH, reduced drip loss, and displayed strong antibacterial efficacy, notably decreasing *E. coli* counts to 0,96 (Log CFU/g) after day 2 while preserving fresh visual appearance. Overall, chitosan-gelatin films with chili leaf extract demonstrate high potential as an eco-friendly active packaging solution to extend poultry shelf-life.



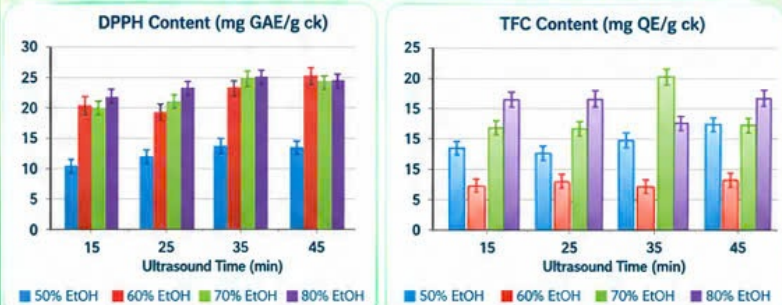
1. Chemical Composition and Bioactivity of *Capsicum frutescens* L. Leaf

Chemical Composition

- Độ ẩm (77,003 ± 1,443 %)
- Lipid (9,467 ± 2,572 mg/g ck)
- Protein (0,037 ± 0,003 mg/g ck)

Bioactive Compounds	Mean ± SD
Hàm lượng phenol tổng (mg GAE/g ck)	36,060 ± 1,991
Hàm lượng flavonoid tổng (mg QE/g ck)	23,519 ± 2,016
Capsaicin (mg/g ck)	229,435 ± 18,441
Hàm lượng DPPH (mg TE/g ck)	1,359 ± 0,098
Hàm lượng ABTS (mg TE/g ck)	51,416 ± 2,599
Khả năng khử sắt (mg Fe ²⁺ /g ck)	3327 ± 252,572

2. Effects of ethanol concentration and ultrasound time on the bioactive content of *Capsicum frutescens* L. leaf extract



OPTIMAL EXTRACTION CONDITIONS

Ethanol concentration: 70%

TPC : 52.43 ± 1.57 mg GAE/g



Ultrasound time: 35 min

DPPH : 25.28 ± 0.33 mg TE/g

3. Effects of *Capsicum frutescens* L. leaf extract incorporation ratios on the structure and bioactivity of chitosan-gelatin films



0% Extract Film



4% Extract Film

TENSILE STRENGTH (MPa)

0% Extract Film: 14,7 ± 5,3 MPa
4% Extract Film: 15 ± 5 MPa

ELONGATION AT BREAK (%)

0% Extract Film: 61,7 ± 13,65 %
4% Extract Film: 48,5 ± 8,05 %

FTIR Spectroscopic Analysis

- Confirmed key characteristic functional groups: -OH (Hydroxyl), Ether, Carbonyl, and Amide in both film formulations.
- Demonstrated successful cross-linking and uniform integration of *C. frutescens* L. leaf extract into the Chitosan-Gelatin matrix.

4. Evaluation of the effects of storage time on chicken meat quality preserved by dip-coated *Capsicum frutescens* L. leaf extract-enriched films

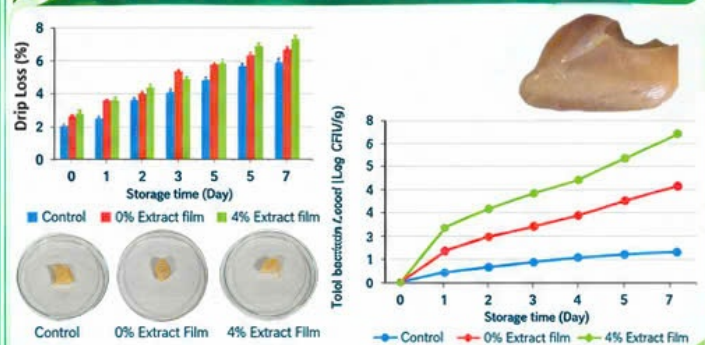


Figure: Visual appearance of chicken meat samples after 7 days of storage (Left: Control, Middle: 0% Extract film, Right: 4% Extract film).

CONCLUSION

- Successfully extracted bioactive compounds (polyphenols, flavonoids, capsaicin) from yellow horn chili leaves using ultrasound-assisted extraction.
- Formulated active Chitosan-Gelatin composite films with uniform structure, stable mechanical properties, and effective intermolecular cross-linking.
- The active dip-coating effectively preserved fresh chicken breast over 7 days by inhibiting bacterial growth, reducing drip loss, stabilizing pH, and maintaining sensory quality.
- Demonstrated high applicability as a bio-based active packaging system for poultry preservation.

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